

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

TWENTY NEW POCKET MICE (*HETEROMYS* AND
LIOMYS) FROM MEXICO.

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E. W. Nelson and E. A. Goldman, in the course of their field work in Mexico for the Biological Survey of the U. S. Department of Agriculture, have collected upwards of 800 specimens of Pocket Mice belonging to the old genus *Heteromys*. A preliminary study of this rich material has resulted in the division of the group into two genera, and in the discovery of a new subgenus and twenty apparently new species and subspecies. These are here described. I am indebted to my assistant, Mr. Goldman, for going over the material and arranging the very large series of specimens by localities, and roughly by species, before I undertook the study of the group.

***Heteromys goldmani* sp. nov.**

Type from Chicharras, Chiapas, Mexico. No. 77,576 ♂ ad. U. S. National Museum, Biological Survey Collection. Collected Feb. 7, 1896 by E. W. Nelson and E. A. Goldman. Original No. 9244.

Characters.—Size very large; tail long and nearly naked, much longer than head and body; pelage coarsely hispid; sole of hind foot naked, 6-tuberculate.

Color.—Upperparts dusky gray, darkest on back and head; underparts,

including upper lip, inner sides of fore and hind legs, fore and hind feet, white; tail dusky, in males only faintly paler below and with tip whitish; in females whitish below on basal $\frac{2}{3}$ and without white tip. Ears without white edges.

Cranial characters.—Skull large and massive; with well developed supraorbital beads and rather large irregularly oval interparietal; frontals broadened by supraorbital shelves; nasals truncate posteriorly on plane of premaxillæ.

Measurements.—Type specimen: total length 347; tail vertebræ 199; hind foot 40.

***Heteromys goldmani lepturus* subsp. nov.**

Type from Mountains near Santo Domingo, Oaxaca, Mexico. No. 73,382 ♂ ad., U. S. National Museum, Biological Survey Collection. Collected June 20, 1895 by E. W. Nelson and E. A. Goldman. Original No. 8120.

Characters.—Similar to *goldmani* but smaller and much less black, the head and back grizzled with fulvous, nose and ankles dusky by contrast; hind feet and tail decidedly shorter; rostrum broader, broadening gradually to zygomata with much less of the usual notch. Contrasted with *griseus* the animal is darker; skull heavier, broader, flatter, with more strongly developed supraorbital beads.

Measurements.—Type specimen: total length 340; tail vertebræ 191; hind foot 39.

***Heteromys griseus* sp. nov.**

Type from Mountains near Tonalá, Chiapas, Mexico. No. 76,062 ♂ ad., U. S. National Museum, Biological Survey Collection. Collected August 15, 1895 by E. W. Nelson and E. A. Goleman. Original No. 8339.

Characters.—Size large but smaller than *goldmani*; tail much longer than head and body and nearly naked; general color grizzled grayish brown; sole of hind foot naked, 6-tuberculate.

Color.—Upperparts drab, grizzled on head and back with black-tipped hairs; underparts, upper lip and fore and hind feet white; ears without white edging; tail dusky above, whitish beneath except near tip which is dark all round; lateral line faint except on side of face where it appears as a broad pale buffy-fulvous band.

Cranial characters.—Skull long and rather heavy, similar in general to that of *goldmani* but slightly smaller and less massive, with narrower and more arched braincase, and with less extreme development of supraorbital ridges.

Measurements.—Type specimen: total length 325; tail vertebræ 186; hind foot 38.

Heteromys annectens sp. nov.

Type from Pluma, Oaxaca, Mexico. No. 71,510 ♂ ad., U. S. National Museum, Biological Survey Collection. Collected March 18, 1895 by E. W. Nelson and E. A. Goldman. Original No. 7674.

Characters.—Size medium; tail long, slightly exceeding head and body; color dark; lateral line conspicuous; sole of hind foot hairy posteriorly, 6-tuberculate.

Color.—Upperparts blackish brown (nose, top of head and back mainly black; face and sides mainly brown, grizzled with black); lateral line bright fulvous, continuous from cheeks to thigh (in males continued on sides of scrotum); underparts and feet white, the hind feet sometimes clouded; tail indistinctly bicolor, dusky above, whitish beneath except terminal part which is dark all round.

Cranial characters.—Skull rather large and broad with rather spreading zygomata and narrow rostrum. In general similar to *gaumeri* but smaller, narrower interorbitally, with more abruptly spreading zygomata and smaller interparietal.

Measurements.—Type specimen: total length 300; tail vertebræ 165; hind foot 33.

Subgenus **Xylomys** nob.

Type, Heteromys (Xylomys) nelsoni sp. nov.

Pelage soft (without stiff bristles); inner side of foreleg (between wrist and elbow), and of hind leg, dark; skull light; braincase high and rounded; supraorbital beads small and faint; *upper surface of maxillary root of zygomata large, heavy and rectangular*; frontals much elongated, pushing nasals and premaxillæ far forward; under jaw broad, *without trace of tubercle over root of incisor*, and with angle very slightly everted. Dentition heavy. Posterior prism of last upper molar more or less completely double, the crown of the tooth presenting two complete transverse loops and a more or less perfect posterior loop.

Heteromys (Xylomys) nelsoni sp. nov.

Type from Pinabete, Chiapas, Mexico. No. 77,920 ♂ ad., U. S. National Museum, Biological Survey Collection. Collected February 11, 1896 by E. W. Nelson and E. A. Goldman. Original No. 9281.

Characters.—Size very large; ears large; tail very long, much exceeding head and body and nearly naked; color grayish dusky; sole of hind foot naked, 6-tuberculate.

Color.—Upperparts, including fore and hind legs (except basal part of underside of foreleg and indistinct streak on hind leg), mouse gray, darkening to dusky on top of head and along middle of body; underparts including upper lip, fore feet, basal part of inner side of fore leg,

and indistinct streak on inner side of hind leg, white; hind feet whitish, clouded above; tail dusky above, whitish beneath (except tip, which is dark all round); ears without whitish edges.

Cranial characters.—Skull long and slender, rather light, rounded on the sides, narrow across anterior roots of zygomata, with exceedingly faint supraorbital beads, small oval interparietal, no tubercle over root of lower incisor, and large teeth; rostrum long and slender; nasals truncate or slightly emarginate, ending on same plane with premaxillæ.

Measurements.—Type specimen: total length 356; tail vertebræ 195; hind foot 43.5.

Genus *Liomys* nob.

Type, Heteromys alleni Coues.

Characters.—Size medium or small; pelage hispid; tail rarely longer than head and body, well haired; skull murine in general appearance; angle of jaw strongly everted; molar crowns, above and below, consisting of two parallel transverse loops which with advancing age unite on one side (inner side on upper row, outside on lower row) to form a horseshoe as in *Heteromys*, but without additional lobes or permanent enamel islands.

Liomys texensis sp. nov.

Type from Brownsville, Texas. No. 58,670 ♀ ad., U. S. National Museum, Biological Survey Collection. Collected February 19, 1894 by J. Alden Loring. Original No. 1672.

Characters.—Size medium or rather small; general color coarsely grizzled reddish brown. Hind foot with 5 pads. Similar in general to *Liomys alleni*, but smaller, paler, redder, and much more coarsely grizzled.

Color.—Upperparts pale grayish brown or drab, coarsely grizzled with red and blackish hairs (the red predominating); underparts yellowish white; ears edged with whitish; hind feet and underside of tail white.

Cranial characters.—Skull similar in general to that of *alleni* but smaller and lighter, with much narrower rostrum (especially posteriorly) and smaller (short oval) interparietal.

Measurements.—Type specimen: total length 231; tail vertebræ 114; hind foot 30 [probably 32].

Liomys canus sp. nov.

Type from Parral, Chihuahua, Mexico. No. 96,259 ♂ ad., U. S. National Museum, Biological Survey Collection. Collected Sept. 21, 1898 by E. W. Nelson and E. A. Goldman. Original No. 13,036.

Characters.—Size largest of the group; tail hairy; hind foot with 5 pads. Closely related to *alleni* but larger and grayer.

Color.—Upperparts gray, rather finely grizzled with a mixture of dark hairs, pale fulvous, and the white of the basal part of the hairs which shows through; lateral line absent or indistinct and confined to flanks; underparts and feet white; tail sharply bicolor; above blackish, below white except at tip which is dark all round; ears conspicuously edged and broadly tipped with whitish.

Cranial characters.—Skull large and massive, the frontal region broad and flat; parietal broadly oval; nasals truncate posteriorly. Similar in general to *alleni* but larger and heavier and very much broader between orbits.

Measurements.—Type: total length 276; tail vertebræ 138; hind foot 34.

Liomys torridus sp. nov.

Type from Cuicatlan, Oaxaca, Mexico. No. 69,645 ♀ ad., U. S. National Museum, Biological Survey Collection. Collected October 14, 1894 by E. W. Nelson and E. A. Goldman. Original No. 6904.

Characters.—Size small; color gray; ears medium and only indistinctly edged with white; tail longer than head and body, bicolor, well haired; hind feet small (28 mm.). Hind foot with 5 pads. Contrasted with *Liomys albolimbatus* and *alleni* it is decidedly smaller, with much smaller hind feet, much less distinct ear edgings, and whitish forelegs [in both the others the forelegs are gray or dusky on outer side].

Color.—Upperparts gray, grizzled with black on top of head and back, forming a dark saddle on the gray; lateral line usually indistinct; underparts, forelegs, and fore and hind feet whitish; tail dark above, whitish below except at tip which is dark all round.

Cranial characters.—Skull small but rather heavy; zygomata rather broadly and squarely spreading; interparietal narrowly elongate-oval; nasals truncate or slightly emarginate. Easily distinguished from *albolimbatus*, which inhabits the same region, by its much smaller size, smaller teeth, and truncate nasals.

Measurements.—Type specimen: total length 242; tail vertebræ 134; hind foot 28.

Liomys torridus minor subsp. nov.

Type from Huajuapam, Oaxaca, Mexico. No. 70,301 ♀ ad., U. S. National Museum, Biological Survey Collection. Collected November 18, 1894 by E. W. Nelson and E. A. Goldman. Original No. 7061.

Characters.—Similar to *torridus* but even smaller, with smaller ears, and shorter feet and tail; color more uniform grizzled gray, the back lacking the dark saddle; skull smaller; braincase more arched; interparietal more broadly oval; base of rostrum broader; bullæ smaller and more smoothly rounded.

Measurements.—Type specimen: total length 222; tail vertebræ 125; hind foot 27.

***Liomys plantinarenis* sp. nov.**

Type from Plantinar, Jalisco, Mexico. $\frac{335}{456} \frac{95}{30}$ ♀ ad., U. S. National Museum, Biological Survey Collection. Collected April 4, 1892 by E. A. Goldman. Original No. 2383.

Characters.—Size small—smallest of the *pictus* group; ears small; color reddish; tail lightly haired; hind foot with 5 pads.

Color.—Upperparts grizzled fulvous and blackish, the fulvous predominating except on the saddle, where they are about equally mixed; lateral line fulvous, broad and continuous from throat to thigh; underparts yellowish white; feet white; tail bicolor, drab above, whitish below; ears edged with whitish.

Cranial characters.—Skull smallest of the group [and in fact, of the known species of the genus] arched and rounded; nasals deeply notched posteriorly, ending essentially on same plane with premaxillæ; supraorbital bead faint; interparietal narrowly oval. Differs from *pictus* in much smaller size, notched instead of truncate nasals, narrow instead of broad interparietal, and smaller and more decurved rostrum and nasals.

Measurements.—Type specimen: total length 202; tail vertebræ 102; hind foot 26.

***Liomys pictus rostratus* subsp. nov.**

Type from near Ometepec, Guerrero, Mexico. No. 71,488 ♂ ad., U. S. National Museum, Biological Survey Collection. Collected February 14, 1895 by E. W. Nelson and E. A. Goldman. Original No. 7447.

Characters.—Similar to *pictus* but slightly larger; pelage coarser; color less red. Skull larger and heavier; rostrum and nasals decidedly longer; interparietal more oval; interorbital region broader; nasal endings either truncate or slightly notched.

Measurements.—Type specimen: total length 252; tail vertebræ 133; hind foot 29.

***Liomys pictus isthmus* subsp. nov.**

Type from Tehuantepec, Mexico. No. 73,367 ♂, U. S. National Museum, Biological Survey Collection. Collected April 28, 1895 by E. W. Nelson and E. A. Goldman. Original No. 7796.

Characters.—Similar to *pictus*, from which it differs in color, the upperparts being very much paler, much less red, the lateral line absent or faint; the dark nose patch obsolete. The differences are marked when the animals are turned on their sides, the bright fulvous cheeks of *pictus* contrasting strongly with the pale grayish brown cheeks of *isthmus*. The skull is slightly smaller, with narrower rostrum and more evident supraorbital bead.

Measurements.—Type: total length 245; tail vertebræ 130; hind foot 30.

***Liomys sonorana* sp. nov.**

Type from Alamos, Sonora, Mexico. No. 96,252 ♂ ad., U. S. National Museum, Biological Survey Collection. Collected December 19, 1898 by E. A. Goldman. Original No. 13,299.

Characters.—Size medium or rather large; pelage strongly hispid; tail hairy; general color harshly grizzled grayish brown; hind foot with 6 pads. Size, color, and general external appearance much as in *Liomys alleni*, but cranially different, and foot pads 6 instead of 5.

Color.—Upperparts grayish drab, coarsely grizzled with fulvous and dark hairs; underparts yellowish white; lateral line fulvous, distinct from under eye to thigh; ears lightly edged with white; feet white, band across end of nose and base of whiskers brownish; tail above dusky, below whitish on basal $\frac{2}{3}$, becoming dusky on terminal third.

Cranial characters.—Skull rather large, decidedly heavier than that of *pictus*; rostrum long and slender with parallel sides; nasals long, deeply emarginate posteriorly; interparietal roughly oval. Compared with *Liomys pictus* the skull and teeth are larger and heavier; braincase higher; rostrum longer; nasals longer and deeply notched (instead of truncate or faintly emarginate); anterior roots of zygomata heavier and stronger.

Measurements.—Type specimen: total length 262; tail vertebræ 142; hind foot 32.5.

***Liomys veræcrucis* sp. nov.**

Type from San Andreas Tuxtla, Vera Cruz, Mexico. No. 65,457 ♀ ad., U. S. National Museum, Biological Survey Collection. Collected May 7, 1894 by E. W. Nelson and E. A. Goldman. Original No. 6174.

Characters.—Size medium; tail scantily haired; hind foot with 6 pads; color dark.

Color.—Upperparts dark brown, strongly grizzled with black-tipped bristles and intermixed irregularly on head and shoulders with soft fulvous hairs; lateral line most evident on sides of face, faint or absent on sides of body; nose and ankles dusky; ears not appreciably edged with whitish, except near inferior base; tail bicolor, dusky above, whitish beneath.

Cranial characters.—Skull small and smoothly rounded; frontals anteriorly, and base of rostrum rounded off on side; upper surface of anterior root of zygomata strongly depressed and rounded; nasals notched posteriorly, decurved anteriorly; interparietal sub-triangular. Skull similar in general to that of *pictus*—of which it may prove a subspecies—but braincase higher and more arched; frontals narrower between orbits; rostrum (particularly premaxillæ) broader; zygomata more outstanding, with anterior root heavier and broader.

Measurements.—Type specimen: total length 220; tail vertebræ 108; hind foot 25.

Liomys obscurus sp. nov.

Type from Carrizal, Vera Cruz, Mexico. No. 108,563 ♀ ad., U. S. National Museum, Biological Survey Collection. Collected May 12, 1901, by E. W. Nelson and E. A. Goldman. Original No. 14,714.

Characters.—Size (particularly hind foot) rather large for the *pictus* group (to which it belongs); pelage hispid; color blackish; lateral line conspicuous; tail bicolor; hind foot with 6 pads.

Color.—Upperparts mainly blackish, becoming grayish on sides, and grizzled slightly with fulvous and much more with whitish (due to the showing through of the light basal part of the hairs).

Cranial characters.—Skull clearly of the *pictus* type but differing from *pictus* in being slightly heavier and in having the braincase higher, the rostrum and nasals a little longer; nasal endings truncate or emarginate. Compared with its geographic neighbor, *verærucis*, the skull as a whole, but particularly the rostrum, is longer and narrower, the rostrum less decurved, anterior root of zygomata lighter.

Measurements.—Type specimen: total length 230; tail vertebræ 124; hind foot 31.

Liomys phæura sp. nov.

Type from Pinotepa, Oaxaca, Mexico. No. 71,500 ♀ ad., U. S. National Museum, Biological Survey Collection. Collected February 21, 1895 by E. W. Nelson and E. A. Goldman. Original No. 7553.

Characters.—Size small; ears rather large; hind foot with 6 pads; tail short and dark all round except under side near base; color grizzled drab brown; skull broad and short.

Color.—Upperparts drab brown grizzled with black and pale fulvous; underparts yellowish white; lateral line fulvous, reaching from in front of eye to thigh; ears faintly edged with whitish; nose and ankles dusky; feet white; tail dusky all round except basal third of under side which is pale, without line of demarcation.

Cranial characters.—Skull broad, short and flat; rostrum and nasals short and slender; braincase and frontals broad: interparietal subtriangular and rather small; zygomata squarely spreading.

Measurements.—Type specimen: total length 204; tail vertebræ 95 [extreme tip gone]; hind foot 29.

Liomys orbitalis sp. nov.

Type from Catemaco, Vera Cruz, Mexico. No. 65,452 ♀ ad., U. S. National Museum, Biological Survey Collection. Collected April 29, 1894 by E. W. Nelson and E. A. Goldman. Original No. 6129.

Characters.—Size medium; pelage strongly hispid; tail slightly shorter than head and body, sparsely haired; hind foot with 6 pads. Skull broad and heavy, peculiar.

Color.—Upperparts dark brown, blackish on saddle, with only very slight grizzling of fulvous; lateral line narrow or indistinct; underparts and feet white; nose and ankles dusky; tail dusky above, whitish beneath except near tip which is dark all round.

Cranial characters.—Skull very broad, much more massive than in *pictus* series; nasals slightly emarginate posteriorly, rather broad, their sides parallel on posterior half, then suddenly expanding; *zygomata* heavy and much more widely and squarely spreading than in any other species; interorbital region and base of rostrum flat; interparietal nearly oval; rostrum rather short, with parallel sides; superciliary beads more strongly developed than usual, and reaching back to middle of parietals.

Measurements.—Type specimen: total length 225; tail vertebræ 109; hind foot 29.

Liomys crispus sp. nov.

Type from Tonalá, Chiapas, Mexico. No. 75,105 ♂ ad., U. S. National Museum, Biological Survey Collection. Collected August 7, 1895 by E. W. Nelson and E. A. Goldman. Original No. 8283.

Characters.—Appearance strikingly different from all known members of the genus; size small; tail decidedly shorter than head and body and scantily haired, the scales evident; hind foot with 6 pads; color gray, sprinkled with hoary hairs *with recurved tips*.

Color.—Upperparts gray, darkest along middle of back and everywhere sprinkled with slender whitish-tipped hairs which stand out or have the tips recurved, giving the animal a unique appearance; underparts and feet whitish; no trace of lateral line; ears not edged with whitish; tail pale dusky, palest (sometimes whitish) beneath but without line of demarcation.

Cranial characters.—Skull mouse-like, with exceedingly faint supra-orbital beads, large roughly oval interparietal, rather broad nasals with parallel sides, squarely truncate behind on same plane with premaxillæ.

Measurements.—Type specimen: total length 210; tail vertebræ [extreme tip gone] 99; hind foot 27.5.

Liomys crispus setosus subsp. nov.

Type from Huehuetan, Chiapas, Mexico. No. 77,588 ♀ old., U. S. National Museum, Biological Survey Collection. Collected February 22, 1896 by E. W. Nelson and E. A. Goldman. Original No. 9364.

Characters.—Similar to *crispus* but pelage much coarser and more hispid; color darker; recurved pale-tipped hairs less abundant; tail averaging longer; skull larger and more massive; supraorbital beads more strongly developed; nasals more cuneate (sides less parallel), less squarely truncate posteriorly, and ending anterior to premaxillæ. May prove a distinct species.

Measurements.—Type specimen: total length 225; tail vertebræ 110; hind foot 29.

***Liomys heterothrix* sp. nov.**

Type from San Pedro Sula, Honduras. No. 90,161 ♂ ad., U. S. National Museum, Biological Survey Collection. Collected July 16, 1897 by J. C. Ingersoll. Original No. 20 (884x).

Characters.—Size medium, a little larger than *L. crispus setosus*, its nearest known relative; tail nearly naked, about equaling head and body; color grizzled brownish, the blackish dorsal bristles overlaid by slender protruding hairs with recurved rusty tips; ears without edging; hind foot with 6 pads.

Color.—Upperparts dark drab brown, grizzled with black-tipped bristles and much more conspicuously with slender ferruginous-tipped hairs which protrude beyond the other hairs and are more or less recurved; underparts and feet yellowish white; tail dark, indistinctly paler below.

Cranial characters.—Skull similar to that of *L. crispus setosus* from Huehuetan, Chiapas, but somewhat larger and heavier, and broader across anterior roots of zygomata.

Measurements.—Type specimen: total length 255; tail vertebræ 126; hind foot 31.